

**Notice of Allowability**

Application No.

10/603,986

Examiner

Kevin M Bernatz

Applicant(s)

HASEGAWA ET AL.

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to interview of March 17, 2005.
2. ☒ The allowed claim(s) is/are 1,3-6,8,9,21-25 and 27-29.
3. ☒ The drawings filed on 24 June 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All b) ☐ Some\* c) ☐ None of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
  - \* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 03172005.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

***Examiner's Amendment***

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Anthony Curtis on March 17, 2005.

The application has been amended as follows:

- Claim 1, lines 13 - 14: after "second antiferromagnetic layers;"; the following phrase was inserted: "a third antiferromagnetic layer disposed on the second free magnetic layer, wherein the second antiferromagnetic layer is disposed on both side regions of the third antiferromagnetic layer;";
- Claim 7 was cancelled;
- Claim 8, line 1: the dependency was changed **from** "Claim 7" **to** "Claim 1";
- Claims 10 – 20 were cancelled;
- Claim 26 was cancelled;
- Claim 28, lines 12 – 13: after "second antiferromagnetic layers;"; the following phrase was inserted: "a third antiferromagnetic layer disposed on the second free magnetic layer, wherein the second antiferromagnetic layer is disposed on both side regions of the third antiferromagnetic layer;";
  - Claim 28, line 17: the phrase "exposed portion of the second free magnetic" was replaced with the word "ferromagnetic";

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- Claim 28, last 3 lines: the phrase “, wherein the nonmagnetic layer ... Cu, and Cr” was deleted.
- Claim 29, lines 13 – 14: after “on the exposed portion;”, the following phrase was inserted: “a third antiferromagnetic layer disposed on the second free magnetic layer, wherein the second antiferromagnetic layer is disposed on both side regions of the third antiferromagnetic layer;”; and
- Claim 30 was cancelled.

### ***Reasons for Allowance***

3. The present claims are deemed allowable over the references of record since the references of record fail to disclose or render obvious a magnetic sensing element meeting the claimed structural limitations.

While the prior art of record disclose magnetic sensing elements comprising substantially the claimed structure with regard to the multilayer film, electrodes, insulating layers and the second free and antiferromagnetic layers, the prior art of record fail to disclose or render obvious after “second antiferromagnetic layers;”, the following phrase was inserted: “a third antiferromagnetic layer disposed on the second free magnetic layer, wherein the second antiferromagnetic layer is disposed on both side regions of the third antiferromagnetic layer”.

4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Examiner's Comment***

5. The Examiner notes that tantalum (Ta) is known in the magnetic sensing element as an insulating, or "low conductivity"/"high resistivity" material, as exemplified by Fukuzawa et al. (U.S. Patent App. No. 2005/0030676 A1) (*Paragraph 0329*), Gill et al. (U.S. Patent No. 6,249,406 B1) (*col. 8, lines 16 – 23*), and Hayakawa (U.S. Patent No. 6,459,551 B1) (*col. 6, lines 43 – 48*).

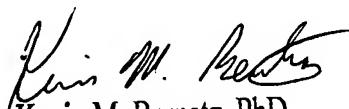
***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB  
March 17, 2005

  
Kevin M. Bernatz, PhD  
Primary Examiner